

REMARKS

The present invention relates to a woven or knitted fabric containing two different types of yarns and clothing containing the fabric.

In the Office Action of July 23, 2007, the drawings were objected to under 37 C.F.R. § 1.83(a), with respect to certain features allegedly not shown in the drawings that were recited in claim 13 (islands in sea weave) and claim 15 (triple layer woven or knit fabric). Claim 17 was rejected under 35 U.S.C. § 112, first paragraph, as allegedly being non-enabling with respect to the fabric being “raised by the raising treatment.” Claims 13, 15, 17, and 19 were rejected under 35 U.S.C. § 112, second paragraph, with respect to certain recitations in each of those claims.

With respect to the prior art, first, claims 1-3, 7-9, 12, 18 and 20-24 were rejected under 35 U.S.C. § 102(b) or alternatively under 35 U.S.C. § 103(a) based on U.S. Patent 6,756,329 (Umino). Claims 4-6 and 13 were rejected under 35 U.S.C. § 103(a) based on Umino in view of U.S. Patent 5,095,548 (Chesebro); claims 10 and 11 were rejected under § 103(a) based on Umino in view of U.S. Patent 6,770,579 (Dawson) and claims 14 and 15 were rejected under § 103(a) based on Umino in view of U.S. Patent 4,341,096 (Safrit). Furthermore, claim 16 was rejected under 35 U.S.C. § 103(a) based on Umino in view of U.S. Publication No. 2003/0056553 (Yamazaki), claim 19 was rejected under § 103(a) based on Umino in view of Yamayaki, and claim 17 was rejected under § 103(a) based on Umino in view of U.S. Patent 4,733,546 (Toda).

Lastly, claims 1-24 were provisionally rejected for obviousness typographical double patenting based on claims 1-20 of copending Application No. 10/548,630.

Applicant has amended the specification at pages 32 - 34, and claims 1, 13, 15, and 19; claims 8 and 17 have been cancelled. In view of the present claims and the remarks below, Applicant respectfully submits that reconsideration and withdrawal of the rejections, and allowance of remaining claims 1-7, 9 - 16, and 18-24 is respectfully submitted to be proper.

Claim 13 has been amended hereinabove, and is explained hereinbelow in more detail. The woven fabric as claimed in claim 13 herein is an embodiment of the fabric as shown in Figs. 5, having a plurality of portions 11 containing, in a high content, the yarns (1) having high water-absorbing, self-elongating property, located separately from each other in the form of islands in a sea consisting of portions in which the high water-absorbing, self-elongating yarns (1) are contained in a low content or no content.

Hereinbelow, reference is made to Referential Figs. 1 and 2, attached hereto to facilitate the following discussion and the Examiner's understanding. Referring to Referential Fig. 1 attached hereto, Referential Fig. 1-(A) shows a weave structure of an embodiment of the woven fabric of the present invention; Referential Fig. 2-(B) shows an explanatory cross-sectional view of the woven fabric as shown in Fig. 1-(A.), along the line A-A intersecting obliquely both the warp and weft directions of the woven fabric.

Referring to Referential Fig. 1-(A) a woven fabric 30 is formed from a plurality of warp yarn groups $W_{(2)}$ and a plurality of warp yarn group $W_{(1+2)}$ alternately arranged with each other and a plurality of weft yarn groups $F_{(2)}$ and a plurality of weft yarn groups $F_{(1+2)}$ alternately arranged with each other. Each of the warp yarn group $W_{(2)}$ and $W_{(1+2)}$ and the weft yarn group $F_{(2)}$ and $F_{(1+2)}$ consists of a plurality of individual yarns arranged in parallel to each other. The individual yarns of the warp yarn groups $W_{(1+2)}$ and the weft yarn group $F_{(1+2)}$ consist of composite or paralleled yarns each formed from yarns (1) having a high water-absorbing and self-elongating property and yarns (2) having a low water-absorbing and self-elongating property.

Also, the individual yarns of the warp yarn group $W_{(2)}$ and the weft yarn group $F_{(2)}$ each consist solely of a yarn (2) having a low water-absorbing and self-elongating property.

The individual warp yarns of the warp yarn groups $W_{(2)}$ and $W_{(1+2)}$ intersect the individual weft yarns of the weft yarn groups $F_{(2)}$ and $F_{(1+2)}$, to form the woven fabric 30. In the resultant woven fabric 30, a plurality of regions 35 are formed from the warp yarns $W_{(1+2)}$ and the weft yarns $F_{(2)}$ intersecting each other, and arranged separately from each other in the warp and weft directions in the form of islands in a sea. Referring to Fig. 1-(A), in a plurality of regions 36, the warp yarns $W_{(2)}$ intersect the weft yarns $F_{(1+2)}$; in a plurality of regions 37, the warp yarns $W_{(1+2)}$ intersect the weft yarns $F_{(2)}$; and in a plurality of regions 38, the warp yarns ($W_{(2)}$) intersect the weft yarns ($F_{(2)}$).

When the woven fabric 30 is wetted with water, the yarns (1) in both the warp and weft yarn groups $W_{(1+2)}$ and $F_{(1+2)}$ located in the regions 35 absorb water and elongate, whereby the regions 35 bulge outside from the upper and/or lower surfaces of the woven fabric to form a plurality of convexities separated from each other in the warp and weft directions, as shown in Referential Fig. 1- (B).

The features of the woven fabric as claimed in accordance with present claim 13 can be easily understood by a person skilled in the art, referring, e.g., to Figs. 5, 6-(A) and 6-(B).

Next, amended claim 15 is discussed. In claim 15, lines 6 to 8, Applicant amended "in every adjacent two layers of the three knitted layers, either one of the two layers being tucked from the other," to --either one of the intermediate layer and the cylinder side knitted layer or the dial side knitted layer being tucked from the other,--.

Similarly, to improve the clarity of the specification, the paragraph bridging pages 32 - 33 and pages 33 - 34 have been amended. Specially, at page 33, line 37 to page 34, line 2, of the description, "either one of ... with another knit ply." has been amended to --either one of the intermediate knit ply and the cylinder side knit ply or the dial side knit ply is tucked with the other.--.

The triple ply knitted fabric as claimed in claim 15 is a modification of the two ply knitted fabric as shown in Figs. 7-(A) and (R). The knitted fabric as claimed in present claim 15 has a triply knitted structure as shown in Referential Fig. 2, in which Referential Fig. 2-(A)

shows an explanatory cross-sectional view of an embodiment of the knitted fabric of the present invention having a three ply knitting structure and being in the dry state; and Referential Fig. 2-(R) shows an explanatory cross-sectional view of the knitted fabric as shown in Fig. 2-(A), in the water-wetted conditions.

Referring to Referential Fig. 2-(A), a dry knitted fabric 40 has a triply knitted structure comprising a cylinder side knitted layer 41, a dial side knitted layer 42, and an Intermediate knitted layer 43 arranged between the above-mentioned cylinder and dial side knitted layers 41 and 42. Either one of the intermediate knitted layer 43 and the cylinder side knitted layer 41 are tucked from the other, and either one of the intermediate knitted layer 43 and the dial side knitted layer 42 are tucked from the other. No tucking structure is shown in Referential Fig. 2-(A). In the triply knitted structure, the intermediate knitted layer 43 is formed solely of the yarns (2) having a low water-absorbing, self-elongating property, and in the cylinder side and dial side knitted layers 41 and 42, regions 41a and 42a are formed from the yarns (2) having a low water-absorbing, self-elongating property and regions 41b and 42b are formed from composite yarns formed from the yarns (1) having a high water-absorbing, self-elongating property and the yarns (2) having a low water-absorbing, self-elongating property. In the cylinder side knitted layer 41, the regions 41a and 41b are arranged alternately with each other, and in the dial side knitted layer 42, the regions 42a and 42b are arranged alternately with each other, in the course direction and/or the wale direction.

When the knitted fabric 40 is wetted with water, in the cylinder and dial side knitted layers 41 and 42, the yarns (2) in the regions 41b and 42b absorb water and elongate to bulge the regions 41b and 42b outwardly, as shown in Referential Fig. 2-(B).

The features of the knitted fabric as claimed in accordance with present claim 15 will be easily understood by a person with ordinary skill in the art from Figs. 7-(A) and (B).

Claim 19 has also been amended hereinabove to improve the clarity thereof. This amendment is supported, e.g., at page 37, lines 13 to 21, of the specification.

Now turning to amended independent claim 1, which has been amended by incorporation of claim 8 therein, and the prior art rejections, the woven or knitted fabric as claimed in amended claim 1 is characterized by the features noted below.

Feature (A): The woven or knitted fabric contains yarns (1) having a high water-absorbing, self-elongating property and yarns (2) having a low water-absorbing, self-elongating property.

Feature (B): The yarns (1) and (2) are arranged in the same direction as each other in the test piece as defined in amended claim 1, and a ratio of the mean length (A) of the yarns (1) measured under the specific load as defined in amended claim 1 to the mean length (B) of the yarns (2) measured under the specific load as defined in the amended claim 1 satisfies the requirements:

$$A/B \leq 0.9.$$

Feature (C): The yarn (1) is constituted from polyetherester fibers formed from polyetherester elastomer comprising hard segments comprising polybutylene terephthalate blocks and soft segments comprising polyoxyethylene glycol blocks.

The combination of features (A), (B) and (C) altogether enables the resultant woven or knitted fabric to exhibit a characteristic performance such that when the fabric is wetted with water, the opening area of the fabric increases to increase the air-permeability of the fabric and when the fabric is dried, the opening area of the fabric decreases to decrease the air-permeability of the fabric, while the change in dimensions and configuration of the fabric is minimized.

Therefore, the woven or knitted fabric of the present invention is useful as a clothing fabric, particularly for underwear and sportswear, because the air-permeability of the fabric increases upon wetting with water although the change in dimensions thereof is relatively small. Also, the woven or knitted fabric of the present invention containing two different types of yarns does need not include expensive conjugated fibers or special processed yarns, and thus is suitable for practical use.

In contrast to the presently claimed invention, in the discussion below Applicant notes the deficiencies of the references cited under 35 U.S.C. § 102(b) and. § 103(a) and the distinctions of the presently claimed invention thereover.

U.S. Patent 6,756,329 B1 (Umino)

Umino discloses a synthetic fiber comprising

(1) a moisture-absorbing and disabsorbing component comprising a modified polyalkylene oxide prepared by reacting polyalkylene oxides, polyols and aliphatic diisocyanate compounds, and (2) a fiber-forming polymer component comprising polyester or polyamide polymer.

The synthetic fiber of Umino has a core-sheath conjugate structure wherein the core is formed from a modified polyalkylene oxide or a mixture of the modified polyalkylene oxide with a polyamide and the sheath is formed from a fiber-forming polymer, for example, a polyester or polyamide polymer.

The core-sheath conjugate synthetic fibers of Umino can be formed into a knitted, woven or/non-woven fabric. Firstly, however, Umino is quite silent as to what change in form or dimensions occurs when the conjugate fiber absorbs or disabsorbs moisture.

However, even more significantly Umino is quite silent as to a woven or knitted fabric formed from two types of yarns (1) and (2) different in water-absorbing and self-elongating property from each other, as defined in claim 1 of the present application.

Accordingly, Umino does not teach or suggest a woven or knitted fabric formed from high water-absorbing, self-elongating yarns (1) and low water-absorbing, self-elongating yarns

(2) arranged in the same direction as each other as defined in claim 1 of the present application, wherein the ratio of mean length (A) of the yarns (1) to mean length (A) of the yarns (2) under the specific load as defined in claim 1 of the present application meets the requirements:

$$A/B \leq 0.9.$$

Further, Umino does not teach or suggest a polyetherester fiber formed from polyetherester elastomer comprising hard segments comprising polybutylene terephthalate blocks and soft segments comprising polyoxyethylene glycol blocks. It is noted that the polyetherester elastomer is a block copolymer and should be definitely distinguished from a mixture of a polyalkylene oxide with a polyester.

Thus, it is seen that Umino does not teach or suggest the woven or knitted fabric having feature (A) in combination with feature (B) and feature (C) of the present invention.

Sill further, it is noted that Umino is quite silent as to the specific advantages of the woven or knitted fabric derived from the combination of features (A), (B) and (C) of the present invention altogether.

Thus, Umino does not affect the novelty or the unobviousness of the present invention as claimed in the present claim 1.

U.S. Patent 5,095,548 (Chesebro Jr.)

Chesebro Jr. discloses a sock including knit leg and foot portions, comprising hydrophobic yarns and hydrophilic yarns. Referring to Fig. 4 of Chesebro Jr., in portions of a knit, a hydrophobic yarn Y-1 and a hydrophobic yarn Y-2 are paralleled to each other and form knitting loops together.

However, in the loops, the hydrophilic yarn and the hydrophobic yarn have the same length as each other. Thus, Chesebro Jr. does not teach or suggest feature (B) of the present invention.

Also, Chesebro Jr. is quite silent as to the hydrophilic yarns having a self-elongating property when wetted with water. Thus, Chesebro. Jr. does not teach or suggest feature (A) of the present invention.

Furthermore, Chesebro Jr. does not teach or suggest the polyetherester elastomer fibers as defined in the amended claim 1 of the present application, namely, feature (C).

Accordingly, Chesebro Jr. does not teach or suggest the woven or knitted fabric as claimed in the amended claim 1 of the present application and thus does not effect the novelty and unobviousness of the present invention.

U.S. Patent 6,770,579 B1 (Dawson)

Dawson discloses a smart film or material comprising two types of layers different in fluid absorption property from each other.

Dawson is quite silent as to a water-absorbing layer having a self-elongating property when wetted with water.

Thus, Dawson does not teach or suggest feature (A) of the present invention as claimed in amended claim 1.

Also, Dawson is quite silent as to features (B) and (C) as defined in the amended claim 1 of the present application.

Thus, Dawson does not affect the patentability of the present invention.

U.S. Patent 4,341,096 (Sufrit et al)

Sufrit discloses a knitted sock having foot portions comprising triple layer fabric including an inner layer, an intermediate layer, and an outer layer, and having improved cushioning characteristics.

However, Sufrit is quite silent as to features (A), (B), and (C) of the woven or knitted fabric as defined in the amended claim 1 of the present application, and thus the specific

advantages of the present invention derived from the combination of features (A), (B) and (C) altogether. Hence, Sufrit does not affect the patentability of the present invention.

U.S. Patent Publication 2003/0056553 A1 (Yamazaki et al)

Yamazaki discloses a tubular knitted fabric for undergarment, comprising a poly(trimethylene)terephthalate 1 fiber crimp yarn and having a specific knitting course and wale densities.

Yamazaki is quite silent as to features (A), (B) and (C) and thus the specific advantages derived from features (A), (B) and (C) combined together. Hence, Yamazaki, and does not affect patentability.

U.S. Patent 4,733,546 (Toda)

Toda discloses a knitted fabric for clothing comprising a layered structure having first inner yarn layer facing a wearer's body and a second outer yarn layer, each yarn layer comprises non-hydroscopic fibers, for example, polyester fibers.

Toda is quite silent as to features (A), (B) and (C) of the present invention and the specific advantages derived from the combination of features (A), (B) and (C) altogether and thus does not affect the patentability of the present invention as defined in the amended claim 1 of the present application.

Combination of the cited references with each other

None of the cited references teach or suggest features (A), (B) and (C) of the present invention.

Thus, none of the combinations of features (A), (B) and (C) with each other can teach or suggest the constitution of the present invention including, as an indispensable feature, a combination of features (A), (B) and (C) altogether, and the specific advantages due to the combination of features (A), (B) and (C) altogether.

Therefore, the above cited prior art references do not affect the patentability of the present invention, and Applicant respectfully submits that the prior art rejections based on the above-noted references should now be withdrawn.

Lastly, with respect to the provisional obviousness-type double patenting rejection, Applicant respectfully traverses, for the reasons explained below.

The woven or knitted fabric as claimed in the present application has the feature that the ratio A/B of a mean length A of the yarn (1) having high water-absorbing, self-elongating property to a mean length (B) of the yarn (2) having a low water-absorbing, self-elongating property satisfies the requirement:

$$A/B \leq 0.9$$

whereas the woven or knitted fabric as claimed in claims 1 to 20 of the copending U.S. Application No. 10/548,630 has the feature that the ratio A/B must satisfy the requirement :

$$A/B > 0.9.$$

Thus, when wetted with water, the water-wetted fabric of the present application exhibits a decreased air permeability due to an increase in the opening area of the fabric, whereas the fabric of U.S. Application 10/548,630 exhibits a decreased air permeability due to decrease in the opening area of the fabric.

Therefore, the woven or knitted fabric of the present invention definitely distinguishes over that of the Application 10/548,630; thus, the provisional rejection is groundless, and should be withdrawn.

In view of the above, reconsideration and allowance of claims 1 - 7, 9 - 16, and 18 - 24 of this application are now believed to be in order, and such actions are hereby earnestly solicited.

If any points remain in issue which the Examiner feels may be best resolved through a personal or telephone interview, the Examiner is kindly requested to contact the undersigned attorney at the local Washington, D.C., telephone number listed below.

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Respectfully submitted,

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